

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

United States Patent and Trademark
Office
(Box PCT)
Crystal Plaza 2
Washington, DC 20231
ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 19 October 1998 (19.10.98)	
International application No. PCT/US97/03994	Applicant's or agent's file reference MOBT136P
International filing date (day/month/year) 03 March 1997 (03.03.97)	Priority date (day/month/year)
Applicant HEIN, Silke et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:30 September 1998 (30.09.98)☐ in a notice effecting later election filed with the International Bureau on:2. The election ☒ was☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Marianna Roux
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 97/03994

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 C12N15/52 C12N15/54 C12N15/70 C12N1/21 C12P7/62
C12N15/82 C12N5/14 //(C12N1/21,C12R1:19)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 C12N C12P

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 518 907 A (DENNIS DOUGLAS E) 21 May 1996 see claims	1
A	W0 95 21257 A (INNOVATIVE TECH CENTER) 10 August 1995 see claims	1
A	W0 93 06225 A (INNOVATIVE TECH CENTER) 1 April 1993 see claims	1
	--- -/-	



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

19 November 1997

Date of mailing of the international search report

04/12/1997

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
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Authorized officer

Delanghe, L

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 97/03994

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
T	<p>CHEMICAL ABSTRACTS, vol. 127, Columbus, Ohio, US; abstract no. 219607, HEIN, SILKE ET AL: "Biosynthesis of poly(4-hydroxybutyric acid) by recombinant strains of Escherichia coli" XP002047459 see abstract & FEMS MICROBIOL. LETT. (1997), 153(2), 411-418 CODEN: FMLED7; ISSN: 0378-1097, -----</p>	1-61

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 97/03994

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5518907 A	21-05-96	US 5371002 A	06-12-94
WO 9521257 A	10-08-95	EP 0742828 A	20-11-96
WO 9306225 A	01-04-93	US 5371002 A	06-12-94
		AU 2147492 A	27-04-93
		EP 0630410 A	28-12-94
		JP 6510425 T	24-11-94
		US 5569595 A	29-10-96

PATENT COOPERATION TREATY

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REC'D 10 MAY 1999

WIPO PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 38-21(15009) A PCT		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US97/03994	International filing date (day/month/year) 03/03/1997	Priority date (day/month/year) 03/03/1997	
International Patent Classification (IPC) or national classification and IPC C12N15/52			
Applicant MONSANTO COMPANY et al.			

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 30/09/1998	Date of completion of this report 06.05.99
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. (+49-89) 2399-0 Tx: 523656 epmu d Fax: (+49-89) 2399-4465	Authorized officer Roscoe, R Telephone No. (+49-89) 2399 2554 

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/US97/03994

I. Basis of the report

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*:

Description, pages:

1-34 as originally filed

Claims, No.:

1-61 as received on 23/04/1999 with letter of 21/04/1999

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims 1-61
	No: Claims
Inventive step (IS)	Yes: Claims
	No: Claims 1-61
Industrial applicability (IA)	Yes: Claims 1-61
	No: Claims

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US97/03994

2. Citations and explanations

see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

1. Citations

The documents mentioned in the present International Preliminary Examination Report are numbered as in the search report, i.e. D1 corresponds to the first document of the search report etc.

**2. Reasoned statement on Novelty, Inventive Step and Industrial Applicability
(Section V)**

2.1 Novelty (Art.33(2) PCT)

The cited prior art does not appear to destroy the novelty of claims 1-61, however applicant is referred to the first paragraph of section 3.1.

2.2 Inventive Step (Art.33(3) PCT)

Document D3 is considered the closest prior art. D3 discloses the production of poly-beta-hydroxybutyrate (PBH) in E. coli. A plasmid comprising the PHB biosynthetic genes from A. eutrophus was introduced into E.coli. As explained on p.6, a host could be chosen which constitutively expresses the acetate utilization genes. Such a host could be grown on a substrate comprising a carbon source and propionate, since the acetylCoA synthetase belonging to the acetate utilization system also accepts propionate as a substrate (p.17) (i.e. it seems that its activity results in the same product as would result from an acetylCoA transferase transferring CoA onto a propionic acid molecule (i.e. a fatty acid)).

Indeed the description of the present application refers to the use of one or the other enzyme as alternative embodiments of the invention (see p.9, I.1-3). This ~~fact supports the authorized authorities view that the principle is clearly the same -~~ i.e. to enzymatically provide additional substrate for the polyhydroxyalkanoic acid synthase pathway (this principle is not invalidated by the fact that the enzymes exhibit significant functional differences). Given that this principle is disclosed in D3 and that the prior art generally extensively describes feeder pathways for the polyhydroxyalkanoic acid synthase pathway, the choice of a specific combination of known enzymes and substrates cannot be considered inventive per se. No surprising effect has been encountered either that could be considered in the

assessment of inventive step. Hence, claims 1-61 are presently not considered inventive.

2.3 Industrial Applicability (Art.33(4) PCT)

Claims 1-61 appear to have industrial applicability.

3. Certain observations (Section VIII)

3.1 Clarity (Art.6 PCT)

The terminology "isolated nucleic acid segment" is technically unclear (i.e. does it exclude the isolated chromosomal DNA of an organism). Due to the broad definitions of (a) polyhydroxyalkanoic acid synthase and (b) fatty acid:acyl-CoA transferase, the authorized authority is convinced that many cells will naturally encode (chromosomally) both types of enzyme - applicant will need to convince the authorized authority that this is not the case (particularly in view of claims such as 15-17). Alternatively, cells that have been transformed with DNA encoding polyhydroxyalkanoic acid synthase (e.g. E. coli in D1 and D2), may naturally have fatty acid:acyl-CoA transferases. The introduction of the term "isolated" is inappropriate in claim 15 anyway since a nucleic acid cannot be considered isolated when it is in a cell.

Vector names "pKSSE5.3" and "pSKSE5.3" in claims 12 and 13, respectively are arbitrary definitions not known to a skilled person. These need to be replaced by technical features if claims to these plasmids are to be maintained. The claims in their present form still fail to fully explain what these vectors consist of (e.g. what the vector backbone consists of / fragment arrangement)

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International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : C12N 15/52, 15/54, 15/70, 1/21, C12P 7/62, C12N 15/82, 5/14 // (C12N 1/21, C12R 1:19)	A1	(11) International Publication Number: WO 98/39453 (43) International Publication Date: 11 September 1998 (11.09.98)
(21) International Application Number: PCT/US97/03994 (22) International Filing Date: 3 March 1997 (03.03.97) (71) Applicant (for all designated States except US): MONSANTO COMPANY [US/US]; 800 North Lindbergh Boulevard, St. Louis, MO 63167 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): HEIN, Silke [DE/DE]; Rosenplatz 1a, D-48143 Münster (DE). SÖHLING, Brigitte [DE/DE]; Hochstrasse 2, D-06110 Halle (DE). GOTTSCHALK, Gerhard [DE/DE]; Johann-Wolfe-Strasse 35a, D-37176 Nörten-Hardenberg (DE). STEINBÜCHEL, Alexander [DE/DE]; Rönneithal 27, D-48341 Altenberge (DE). (74) Agent: KAMMERER, Patricia, A.; Arnold, White & Durkee, P.O. Box 4433, Houston, TX 77210 (US).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i>
(54) Title: METHODS FOR THE BIOSYNTHESIS OF POLYESTERS		
(57) Abstract Coexpression of a polyhydroxyalkanoic acid synthase and either a fatty acid: acyl-CoA transferase or an acyl-CoA synthetase in cells enables the biosynthesis of polyester materials. Plasmids, bacteria, materials, and methods for the preparation of polyesters are disclosed.		

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

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PATENT COOPERATION TREATY

PCT

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INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference MOBT136P	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/US 97/ 03994	International filing date (day/month/year) 03/03/1997	(Earliest) Priority Date (day/month/year)
Applicant MONSANTO COMPANY et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. ☐ Certain claims were found unsearchable (see Box I).
2. ☐ Unity of invention is lacking (see Box II).
3. ☐ The international application contains disclosure of a nucleotide and/or amino acid sequence listing and the international search was carried out on the basis of the sequence listing

- ☐ filed with the international application.
- ☐ furnished by the applicant separately from the international application,
- ☐ but not accompanied by a statement to the effect that it did not include matter going beyond the disclosure in the international application as filed.

☐ Transcribed by this Authority

4. With regard to the title, ☒ the text is approved as submitted by the applicant
- ☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

- ☒ the text is approved as submitted by the applicant
- ☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this International Search Report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is:

Figure No. —

- ☐ as suggested by the applicant.
- ☐ because the applicant failed to suggest a figure.
- ☐ because this figure better characterizes the invention.

☐ None of the figures.